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**Oral Testimony also submitted as written testimony.**

**Caliente, nevada**

**November 9, 1999**

**I am taking this opportunity to thank the Department of Energy for allowing me to submit my statement regarding the DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE NUCLEAR REPOSITORY AT YUCCA MOUNTAIN.**

**my name is Marshall Dunham. I reside at 19 North Spring Street Caliente Nevada. My mailing address is P.O. Box 911 Caliente, Nevada 89008.**

**I will direct my comments to section (S.4.1.3) Geology and Volcanism and section (S.4.1.4) Hydrology of the DEIS.**

**I would like to quote from DEIS section (S.4.13), on geology "Yucca mountain is a product of volcanic activity tat occurred 11.4 million to 14 million years ago and subsequent faulting ... D.O.E. would build the proposed repository and emplace the waste packages in a mass of volcanic rock (welded tuff)... This formation was formed by volcanic ash flow from the calderas north of Yucca Mountain 12.8 million years ago...The panel estimated that the chance of a volcanic disruption at or near the repository during the first 10,000 years after closure would be 1 in 7,000... D.O.E. chose the Topopah Springs formation as the repository host rock because of...3. its location away from major faults that could adversely affect the stability of underground openings and could provide pathways for water flow, eventually leading to radionuclide release, and 4. its location well above the present water table...studies at Yucca Mountain indicate that individual faults have very long recurrence intervals between types of earthquakes that would be powerful enough to cause surface displacement."**

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there are major errors in the above statement based on new data as well information not included in the DEIS and facts boldly stated in the DEIS.

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The recent 7.1 magnitude Hector Mine earthquake of 10-16-99 occurred on the Lavi Lake fault, which was previously mapped by Thomas Dibblee Jr. of the USGS approximately 30 years ago. At the time the fault was not named.

Previous evaluations of the Lavi Lake fault by the California Division of mines and Geology showed the fault had not produced a large earthquake within the last 10,000 years.

the Hector mine quake created a rupture of 40 km with a maximum offset of 3.8 to 4.7 meters.

The Landers earthquake, with a magnitude of 7.4, and the Joshua Tree quake occurred 7 years previous to the Hector Mine quake. These three faults are all include in the same fault zone area, and the California Division of mines stated in their report this could not occur, but it did.

The current USGS view is that these faults remain inactive for thousands of years and then become active for several hundred years before returning to quiescence. This information was obtained from various USGS websites.

Could this same pattern of activity occur in the Yucca Mountain area?

the Skull Valley earthquake of June 1992, with a magnitude 5.6, was triggered by the Lander quake. This scenario will occur again. This information is available on various USGS websites and various publications.

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According to Caltech, since the Hector Mine quake faults have been "talking" to one another. By this they mean that since the Hector Mine quake stress has increased on some faults and decreased on others and at this point it is impossible to tell

where the stress has increased. Has it increased in the Yucca Mountain area. This information was obtained from a CNN interview with a Caltech seismologist and USGS websites.

According to the publication "STATE OF NEVADA NUCLEAR WASTE PROJECT OFFICE SEISMIC RISK MAP OF THE U.S.-SCIENTIFIC AND TECHNICAL CONCERNS" Yucca Mountain has been designated a class 4 earthquake zone, the highest rating by the USGS.

the above publication also note there are 33 known earthquake faults within the repository study area. Two of these faults bisect the proposed repository site.

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A recent study published in Science Magazine, volume 279, March 27, 1998, authored by Brian Wernicke et. al. demonstrates that crustal movement in the Yucca Mountain site moving 10 times faster than previous studies have indicated. One conclusion that Wernicke et. al. included was that magma is moving under the repository site. Remember Yucca Mountain is made of volcanic rock.

Of further interest is the Long Valley Caldera in the Mammoth Lakes area. According to USGS website the Yucca Mountain facility is in the path of ash flow when the caldera erupts. Also it may not be known when an eruption would occur. According to the USGS there is an increased chance of an eruption occurring in the near future. A 5cm ash fall would occur at Yucca Mountain when an eruption occurs at the Long Valley Caldera. Such an ash fall would turn day into night as we witnessed after Mt. St. Helen's erupted. the ash itself is highly corrosive causing severe damage to casks stored above ground, as well as disrupting transportation.

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The most bold and ironic statement is that the Yucca Mountain facility is placed in volcanic ash (welded tuff) that came from just north of the repository. When will the

**eruptions occur again? 100 years, 1000 years? It will occur again.**

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below)

**When the magma starts moving it will intrude into the repository , as it has done in the past. When the intrusion occurs fractures in the rock would allow radioactive material into the water table thereby polluting the Amargosa Valley water supply.**

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**one must also consider what a magnitude 7 earthquake would do to the Yucca Mountain area. It would certainly disrupt road and rail lines as well as power and communications. We have all seen this on television after past quakes.**

**when the faults within the repository area fracture the storage casks would be breached and the repository split open like a ripe melon thereby releasing a stream of continuous fallout until the repository can be resealed. If at a possible.**

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**If the Lavi Lake and Landers faults are creating more stress on the Yucca area faults further and immediate study is needed to determine the new risks and hazards. Just based on Wernicke's work the current DEIS is not sufficient and requires further study.**

3 (continued  
from above)

**Magma is moving under Yucca Mountain and we all have a problem and we need to know about it before any further work on the repository is done.**

**The current DEIS is deficient because it never considered the Long Valley Caldera and its eventual eruption.**

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from p. 3)

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from p. 2)

**Since the western Mojave desert faults are now "talking" to other faults the public needs to know the consequences.**

**Further study is needed in this area immediately.**

**It is my opinion that the DEIS is a seriously flawed document in regards to geology and hydrology and is already out of date given the recent seismic activity and the data gathered from it**

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**. All work should stop until it is known thoroughly that the Yucca site is safe or not. Currently it does not appear safe nor can it be made safe.**

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